


1a CDT - 013/04

54B00-GG00

COPIED CEF  
DATE: 8/12/04  
"VERIFY THAT THIS IS  
THE CORRECT VERSION  
BEFORE USE"

1	DELETED REFERENCES TO "CLEANING" IN SECTION 1, SCOPE, AND IN SECTION 3, GENERAL REQUIREMENTS; IN SECTION 2, APPLICABLE PUBLICATIONS, REPLACED AIR FORCE-NAVY SPEC. "AN806" WITH "AS5168", REPLACED MSFC SPEC. "MC240" WITH "AS5202", REPLACED MILITARY STANDARD "MS29512" WITH "AS29512" AND REPLACED MILITARY SPEC. "MIL-H-6875" WITH "AMS-H-6875"; REPLACED "MTF" WITH "SSC" THROUGHOUT THE DRAWING; IN SECTION 6, REPORTS, ADDED "(ELECTRONIC COPY PREFERRED)"; IN SECTION 11, END CONNECTIONS, CHANGED "GRAYLOC CONNECTORS" TO "CLAMP-TYPE CONNECTORS"; IN SECTION 12, PORTS, ADDED THE ENTIRE SECOND PARAGRAPH; IN SECTION 16, WELDING, CHANGED "ELECTRIC METAL ARC" TO "SHIELDED METAL ARC WELDING", CHANGED "INERT GAS SHIELDED ARC" TO "GAS TUNGSTEN ARC WELDING" AND CHANGED "GRAYLOC CONNECTORS" TO "CLAMP-TYPE CONNECTORS"; IN SECTION 19, PROOF PRESSURE, CLARIFIED THAT "THE MINIMUM ACCEPTABLE PROOF PRESSURE SHALL BE 1.5 TIMES DESIGN PRESSURE"; IN SECTION 20, PNEUMATIC LEAK TEST, REPLACED "LEAK-TEK" WITH "SHERLOCK 5-SECOND LEAK DETECTOR"; ADDED SECTION HEADING "SHIPPING AND IDENTIFICATION"; IN SECTION 25, MAINTENANCE INSTRUCTIONS, ADDED SECOND AND THIRD SENTENCES RELATIVE TO 'PROVIDING CUTAWAY DRAWINGS, PARTS LIST, FILTRATION RATINGS AND RATED FLOW'. DIRECT DRAWING CHANGE PER SWR XJCRW50100.		ISSUED/CEF AUG 11 2004 8/10/04 SDM	
	72.8. 7/29/04 DFD. 8/12/04 (RES T2-3304)			
SYM	ZONE	DESCRIPTION	DATE	APPROVED
REVISIONS				
SIGNATURE		DATE	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	
DRAWN	K. SWANSON	12/01/67	 JOHN C. STERNIS SPACE CENTER SSC, MS 39529-6000	
CHECKED	T.I. BROOKS	2/01/68		
ENGINEER	D.A. DECERBO	2/26/68		
ISSUED	ISSUED/CEF	3/18/68		
SUBMITTED	L. TERRY	2/26/68		
NASA SAFETY				
APPROVED		R.G. SMITH	2/29/68	
USED ON				
CADD CONTROLLED DRAWING CADD P/N: SCD\54B00\GG00\SH1		SIZE B	DWG. NO. 54B00-GG00	REV. 1
		AUTHORITY	SHEET	1 OF 5

1. SCOPE:

THIS DRAWING COVERS THE DESIGN, FABRICATION AND TESTING OF HIGH PRESSURE GAS FILTERS.

DESIGN REQUIREMENTS

2. APPLICABLE PUBLICATIONS:

ASME BOILER AND PRESSURE VESSEL CODE

SECTION VIII      RULES FOR CONSTRUCTION OF PRESSURE VESSELS  
SECTION IX        QUALIFICATION STANDARD FOR WELDING AND BRAZING  
PROCEDURES, WELDERS, BRAZERS, AND WELDING AND BRAZING  
OPERATORS

SAE AEROSPACE STANDARDS

AS5168            FITTING, PLUG, TUBE END, FLARED  
  
AS5202            PORT OR FITTING END, INTERNAL STRAIGHT THREAD, DESIGN  
STANDARD  
  
AS29512          PACKING, PREFORMED, HYDROCARBON FUEL RESISTANT, TUBE  
FITTING, O-RING

SAE AEROSPACE MATERIAL SPECIFICATIONS

AMS-H-6875      HEAT TREATMENT OF STEEL RAW MATERIALS

3. GENERAL REQUIREMENTS:

THE FILTERS SHALL BE DESIGNED, FABRICATED AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED HEREIN. THE MANUFACTURER SHALL PROVIDE ANY ADDITIONAL MEASURES NECESSARY IN THE DESIGN, FABRICATION, INSPECTION AND TESTING TO PRODUCE EQUIPMENT WHICH WILL SATISFACTORILY PASS THE TESTS SPECIFIED HEREIN. THIS SSC DRAWING SHALL GOVERN AND TAKE PRECEDENCE WHERE IT MAY DEPART OR CONFLICT WITH PROVISIONS OF REFERENCED DOCUMENTS.

4. MATERIALS:

THE MATERIALS SHALL BE FREE FROM ALL DEFECTS IMPAIRING STRENGTH, DURABILITY AND APPEARANCE AND OF THE BEST COMMERCIAL QUALITY FOR THE PURPOSE SPECIFIED. ALL MATERIALS SHALL BE NEW AND SHALL HAVE STRUCTURAL PROPERTIES TO SUSTAIN SAFETY AND STRESSES TO WHICH THEY ARE SUBJECTED AT THE DESIGN CONDITIONS.

5. APPROVAL OF DEPARTURES:

ANY DEPARTURE FROM THESE SPECIFICATIONS SHALL BE SUBMITTED TO THE PURCHASER FOR APPROVAL. THE DETAILS OF THE DEPARTURES SHALL INCLUDE CALCULATIONS, DESIGN DRAWING(S) AND LABORATORY TEST DATA WHERE APPLICABLE. ANY DEPARTURES APPROVED BY THE PURCHASER SHALL BE MADE AT NO COST TO THE BUYER.

6. REPORTS:

CERTIFIED COPIES OF THE FOLLOWING REPORTS SHALL BE FURNISHED IN THE QUANTITIES LISTED BELOW. ADDITIONALLY, ONE REPRODUCIBLE CERTIFIED COPY (ELECTRONIC COPY PREFERRED) OF EACH REPORT SHALL BE FURNISHED.

	<u>FOR APPROVAL</u>	<u>CERTIFIED</u>
OUTLINE DRAWING AND SPEC. DEPARTURES	2	2
DETAIL DRAWINGS	2	2
DESIGN CALCULATIONS, MATERIAL SPECS.	2	2
REPORTS OF TESTS REQUIRED UNDER THIS SECTION		2
CLEANING PROCEDURE		2

7. INTERCHANGEABILITY:

WHENEVER POSSIBLE THE FILTERS SHALL BE DESIGNED AND CONSTRUCTED TO PERMIT THE MAXIMUM INTERCHANGEABILITY OF THE FILTER ELEMENTS WITHOUT DETRIMENT TO THE SPECIFIED PERFORMANCE CHARACTERISTIC.

8. MAINTAINABILITY:

THE FILTER DESIGN SHALL BE SUCH THAT ADJUSTMENT AND REPLACEMENT OF THE ELEMENT IN ALL POT, TEE AND L TYPE FILTERS CAN BE MADE WITHOUT REMOVING THE CASE FROM THE LINE, AND WITH A MINIMUM OF SPECIAL TOOLS AND HOISTING DEVICES. WHERE IN-LINE FILTERS ARE SPECIFIED, THE ABOVE REQUIREMENT SHALL NOT APPLY.

9. SUPPORT DATA:

EACH POT OR TEE TYPE FILTER SHALL BE PROVIDED WITH SUPPORT LUGS IN ACCORDANCE WITH FIGURE A. EACH IN-LINE TYPE FILTER, HAVING A NOMINAL DIAMETER OF THREE INCHES OR GREATER SHALL BE PROVIDED WITH A SUPPORT PLATE IN ACCORDANCE WITH FIGURE B. FOR FIGURES A & B REFER TO SHEET 5.

10. LIFTING LUGS:

ALL COMPONENTS WEIGHING MORE THAN 50 POUNDS SHALL BE EQUIPPED WITH LIFTING LUG(S), LOCATED TO PERMIT EASY REMOVAL OF PARTS.

11. END CONNECTIONS:

IF INTEGRAL, CAST-IN CONNECTORS ARE USED, THE MANUFACTURER SHALL BE RESPONSIBLE FOR MEETING THE REQUIREMENTS OF THE MATING FLANGES. WHERE CLAMP-TYPE CONNECTORS ARE SPECIFIED, THEY SHALL CONFORM TO THE STANDARDS OF THEIR RESPECTIVE MANUFACTURER (GRAYLOC, REFLANGE, ETC.).

12. PORTS:

EACH FILTER SHALL HAVE A LOW POINT DRAIN AND HIGH POINT VENT CONSISTING OF A PLUGGED BOSS, CONFORMING TO 1/2 INCH AS5202. IN ADDITION TO THE ABOVE, EACH FILTER SHALL BE FURNISHED WITH CONNECTIONS FOR MEASUREMENT OF DIFFERENTIAL PRESSURE ACROSS THE FILTER. THESE CONNECTIONS SHALL CONFORM TO 1/2 INCH AS5202 AND SHALL BE PLUGGED. THE PLUGS SHALL CONFORM TO AS5168-08 AND THE O-RING GASKETS SHALL CONFORM TO MS29512-08.

FILTERS WITH A DESIGN PRESSURE EXCEEDING 7150 PSIG SHALL BE PROVIDED WITH 9/16 INCH CONED-AND-THREADED MEDIUM PRESSURE PORTS AND PLUGS IN LIEU OF THE 1/2 INCH AS5202 PORTS SPECIFIED IN THE ABOVE PARAGRAPH. (REFERENCE AUTOCLAVE ENGINEERS, BUTECH PRESSURE SYSTEMS OR APPROVED EQUAL FOR MEDIUM PRESSURE DESIGN STANDARDS.)

13. FILTER ELEMENT:

THE FILTER ELEMENTS SHALL BE OF MATERIALS AS INDICATED ON THE INDIVIDUAL FILTER ASSEMBLY DRAWINGS. THE FILTER ELEMENT SHALL BE LOCKED INTO POSITION RELATIVE TO THE CASING FOR ALL OPERATING CONDITIONS. REFER TO SSC DRAWING 54B00-GG01 FOR ADDITIONAL REQUIREMENTS.

14. PRESSURE DROP:

THE PRESSURE DROP PERMISSIBLE FOR THE FILTER ELEMENT AND CASING (INCLUDING NOZZLE LOSSES) SHALL NOT EXCEED THE VALUES SPECIFIED IN THE INDIVIDUAL FILTER ASSEMBLY DRAWINGS. THE ELEMENT SHALL BE DESIGNED SO THAT WHEN 50% OF THE OPENINGS ARE CLOSED/PLUGGED THE TOTAL PRESSURE DROP (ELEMENT AND HOUSING) DOES NOT EXCEED 125% OF THE CLEAN PRESSURE DROP.

15. INNERSEAL:

THE INNERSEAL BETWEEN THE FILTER BODIES AND THE FILTER ELEMENTS SHALL BE LEAKTIGHT AT A DIFFERENTIAL PRESSURE NO LESS THAN THE COLLAPSE PRESSURE RATING OF THE ELEMENT. THE MANUFACTURER'S PROPOSAL SHALL ADEQUATELY DEFINE THE DETAILS OF THESE CONNECTIONS. THE DEFINITION SHALL INCLUDE, WHERE APPLICABLE, DIAMETRAL TOLERANCE BETWEEN THE BORE AND THE MALE GLAND, DEPTH OF THE O-RING GROOVES, AND RECOMMENDED O-RING SELECTIONS. IT IS THE MANUFACTURER'S RESPONSIBILITY TO PROVIDE ELEMENTS COMPATIBLE WITH THE FILTER UNITS TO ACHIEVE THE SPECIFIED SEALING CAPABILITY.

FABRICATION16. WELDING:

ALL WELDING SHALL BE PERFORMED AND INSPECTED IN ACCORDANCE WITH THE ASME BOILER AND PRESSURE VESSEL CODE, SECTIONS VIII & IX. MANUFACTURER SHALL CERTIFY THAT THE WELDS ARE WITHIN REQUIRED SPECIFICATIONS.

CARBON STEEL - ALL CARBON STEEL SHALL BE WELDED BY THE SHIELDED METAL ARC WELDING PROCESS USING COATED ELECTRODES, OR BY THE GAS TUNGSTEN ARC WELDING PROCESS. AN EB CONSUMABLE INSERT OF THE PROPER MATERIAL SHALL BE USED AT ALL WELD JOINTS, OR THE ROOT PASS SHALL BE PERFORMED WITH THE GAS TUNGSTEN ARC WELDING PROCESS.

STAINLESS STEEL - ALL STAINLESS STEEL SHALL BE WELDED BY THE GAS TUNGSTEN ARC WELDING PROCESS. AN INERT GAS BACKUP PURGE SHALL BE MAINTAINED ON THE INTERIOR OF THE FILTER DURING THE WELDING PROCESS.

FLANGED JOINTS - ANSI FLANGED JOINTS SHALL BE PARALLEL WITHIN 1/32 INCH. CLAMP-TYPE CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE INSTRUCTIONS OF THEIR RESPECTIVE MANUFACTURER (GRAYLOC, REFLANGE, ETC.).

BEVELS - CARBON STEEL SHALL HAVE EITHER MACHINE CUT BEVELS, OR SMOOTH, CLEAN, SLAG-FREE FLAME CUT BEVELS. STAINLESS STEEL BEVELS SHALL BE PREPARED BY MACHINING OR GRINDING USING WHEELS OR DISCS UNCONTAMINATED BY PREVIOUS CARBON STEEL WORK.

17. HEAT TREATMENT:

ALL STAINLESS STEEL MATERIALS SHALL BE IN THE ANNEALED CONDITION PRIOR TO FABRICATION. PARTS THAT ARE COLD WORKED SHALL BE ANNEALED AFTER FABRICATION. IF WORK HARDENED PARTS ARE TO BE WELDED, THE ANNEALING SHALL BE PERFORMED BEFORE WELDING. HEAT TREATMENT SHALL BE IN ACCORDANCE WITH AMS-H-6875.

TESTING18. WITNESS OF TEST:

PRIOR TO PURCHASER'S ACCEPTANCE THE FILTERS SHALL BE SUBJECTED TO THE TESTS IN THE SEQUENCE LISTED HEREIN. THE PURCHASER'S AUTHORIZED REPRESENTATIVE SHALL WITNESS ALL THE TESTS, IF SPECIFIED ON THE PURCHASE ORDER. THE MANUFACTURER SHALL NOTIFY THE PURCHASER A MINIMUM OF 72 HOURS PRIOR TO A SCHEDULED TEST SEQUENCE.

19. PROOF PRESSURE:

A HYDROSTATIC PROOF TEST SHALL BE PERFORMED ON EACH FILTER HOUSING IN ACCORDANCE WITH THE ASME BPV CODE, SECTION VIII, EXCEPT THAT THE MINIMUM ACCEPTABLE PROOF PRESSURE SHALL BE 1.5 TIMES THE DESIGN PRESSURE. THE DURATION OF THE TEST SHALL BE A MINIMUM OF 30 MINUTES. DURING THIS PERIOD THE UNIT UNDER TEST SHALL BE SHUT-OFF FROM THE PRESSURE SOURCE AND NO DECREASE IN TEST PRESSURE SHALL BE PERMITTED.

NOTE

THE MANUFACTURER SHALL SUBMIT FOR APPROVAL A DESCRIPTION OF ALL EQUIPMENT AND TEST PROCEDURES TO BE USED FOR THE TESTS SPECIFIED IN PARAGRAPHS 20 AND 21.

20. PNEUMATIC LEAK TEST:

ALL FILTERS SHALL BE SUBJECTED TO A PNEUMATIC LEAKAGE TEST AT THE DESIGN PRESSURE. FILTERS SHALL BE TESTED USING A 5% HELIUM, 95% NITROGEN GAS MIXTURE. ALL MECHANICAL JOINTS, SUCH AS TAPS AND CLOSURES, AS WELL AS WELDS SHALL BE TESTED USING SHERLOCK 5-SECOND LEAK DETECTOR OR AN APPROVED EQUAL. NO LEAKAGE ALLOWED.

21. INNERSEAL LEAK TEST:

EACH FILTER SHALL BE SUBJECTED TO A TESTING PROCEDURE TO DEMONSTRATE THAT THE INNERSEAL BETWEEN THE FILTER BODY AND THE FILTER ELEMENT SHALL BE LEAKTIGHT AT A DIFFERENTIAL PRESSURE NO LESS THAN THE COLLAPSE PRESSURE RATING OF THE ELEMENT. NO LEAKAGE ALLOWED.

22. REJECTION:

FAILURE TO MEET ANY OF THE SPECIFIED TEST REQUIREMENTS SHALL RESULT IN THE REJECTION OF THE UNIT UNDER TEST.

SHIPPING AND IDENTIFICATION23. PREPARATION FOR SHIPMENT:

EACH FILTER SHALL BE PRESSURIZED TO 10 PSIG, USING DRY (-40°F DEW POINT) OIL FREE NITROGEN. THE CLOSURES ON THE ASSEMBLY SHALL BE TIGHT ENOUGH TO MAINTAIN A POSITIVE PRESSURE ON THE ASSEMBLY FOR A MINIMUM OF 90 DAYS. EACH ASSEMBLY SHALL BE EQUIPPED WITH A SMALL GAUGE AND SHUT-OFF VALVE.

24. SPECIAL TOOLS:

TWO SETS OF ALL SPECIAL TOOLS NECESSARY FOR THE MAINTENANCE AND REPAIR OF THE FILTER ASSEMBLIES SHALL BE FURNISHED IN HARD WOOD OR METAL CONTAINERS. WHERE TOOLS CAN BE INTERCHANGED BETWEEN THE VARIOUS ASSEMBLIES, DUPLICATE SETS NEED NOT BE PROVIDED FOR EACH FILTER. SPECIAL TOOLS SHALL BE TAGGED FOR IDENTIFICATION IN ACCORDANCE WITH SSC DWG 54000-GP01. THE MANUFACTURER'S ORIGINAL BID SHALL INCLUDE A DESCRIPTION OF ALL SPECIAL TOOLS REQUIRED (INITIAL PROCUREMENT ONLY).

25. MAINTENANCE INSTRUCTIONS:

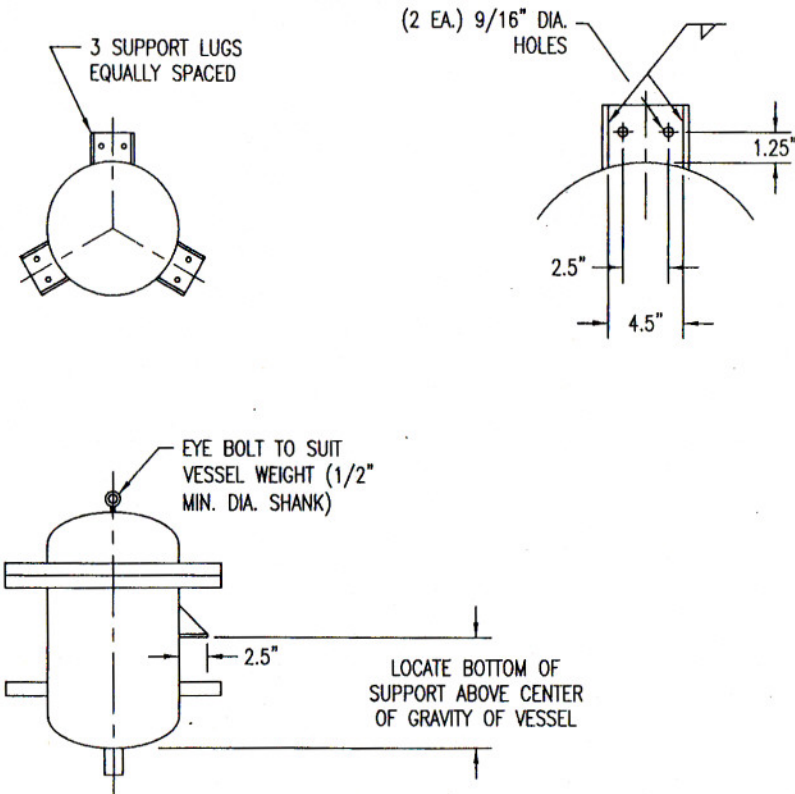
THE MANUFACTURER SHALL FURNISH 3 SETS OF MAINTENANCE MANUALS COVERING ALL OPERATIONS ASSOCIATED WITH THE DISASSEMBLY, ASSEMBLY, ADJUSTMENT AND CLEANING OF THE FILTER ASSEMBLIES. THE MANUALS SHALL PROVIDE NOMINAL AND ABSOLUTE FILTRATION RATINGS IN MICRONS, AND RATED FLOW AT THE MAXIMUM DESIGN PRESSURE DROP (CLEAN). THEY SHALL ALSO INCLUDE A CUTAWAY DRAWING WITH BUBBLE NUMBERS, AND A PARTS LIST WITH PART NUMBERS AND MATERIALS OF CONSTRUCTION OF ALL PIECE PARTS FOR EACH FILTER ASSEMBLY. SEPARATE INSTRUCTIONS FOR EACH FILTER ASSEMBLY WILL NOT BE REQUIRED IF THE ASSEMBLIES ARE IDENTICAL.

26. IDENTIFICATION:

A NAMEPLATE SHALL BE SECURELY AFFIXED TO THE FILTER CASING AND IN A CONSPICUOUS PLACE. THE NAMEPLATE SHALL CONTAIN THE FOLLOWING INFORMATION:

FILTER DESIGNATION  
MANUFACTURER'S NAME  
ASSEMBLY PART NUMBER  
ELEMENT PART NUMBER  
WEIGHT OF ASSEMBLY  
DESIGN PRESSURE/TEMPERATURE  
DESIGN DELTA P  
MANUFACTURER'S SERIAL NUMBER

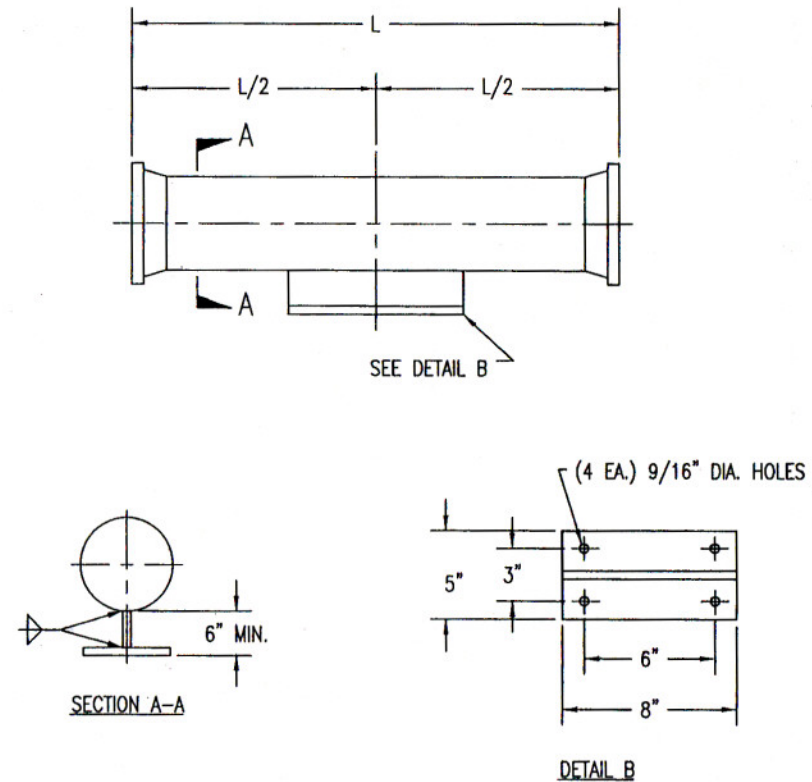
FIGURE A:



## NOTES:

1. ALL WELDING OF SUPPORTS AND EYE BOLT TO BE DONE BEFORE PRESSURE TESTING VESSEL.
2. USE REINFORCING PADS BEHIND SUPPORTS AS REQUIRED.

FIGURE B:



## NOTE:

1. WELDING OF SUPPORT TO VESSEL TO BE DONE BEFORE PRESSURE TESTING.